

SEQUENCE LISTING

<110> Ruoho, Arnold E.
Geiser, Andrew H.
Krebs, Mark
Sievert, Mike

<120> BACTERIORHODOPSIN/G PROTEIN-COUPLED RECEPTOR CHIMERAS

<130> 960296.95581

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<160> 12

<170> PatentIn Ver. 2.0

<210> 1

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<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide

<400> 1

cgcgatatcca gtcgtgtggc

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<210> 2

<211> 20

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:oligonucleotide

<400> 2

cctcctgagg agtcgtgcga

20

<210> 3

<211> 91

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide

<400> 3

atcctgtacg tgctgttctt cgggttcacc gtcaaggagg cggcggcgca gcagcaggag 60
tcggcgacga cgcagaaggc ggagaaggag g 91

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<110> Ruoho, Arnold E.
Geiser, Andrew H.
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<120> BACTERIORHODOPSIN/G PROTEIN-COUPLED RECEPTOR CHIMERAS

<130> 960296.95581

<140>
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<150> 60/098950
<151> 1998-09-03

<160> 53

<170> PatentIn Ver. 2.0

<210> 1
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<212> DNA
<213> Halobacterium salinarium

<220>
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<222> (394)..(1182)

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<400> 1
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cacgagtttt tcgtgcgctt cgagtggtaa cacgcgtgca cgcacgact tcaccgcggg 180
tgtttcgacg ccagccggcc gttgaaccag caggcagcgg gcatttcaca gccgctgtgg 240
cccacacact cgggtggggtg cgctattttg gtatgggttg gaatccgcgt gtcggctccg 300
tgtctgacgg ttcacgggtc taaattccgt cacgagcgta ccatactgat tgggtcgtag 360
agttacacac atatcctcgt taggtactgt tgc atg ttg gag tta ttg cca aca 414
                               Met Leu Glu Leu Leu Pro Thr
                               1           5

gca gtg gag ggg gta tcg cag gcc cag atc acc gga cgt ccg gag tgg 462
Ala Val Glu Gly Val Ser Gln Ala Gln Ile Thr Gly Arg Pro Glu Trp
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atc tgg cta gcg ctc ggt acg gcg cta atg gga ctc ggg acg ctc tat	510
Ile Trp Leu Ala Leu Gly Thr Ala Leu Met Gly Leu Gly Thr Leu Tyr	
25 30 35	
ttc ctc gtg aaa ggg atg ggc gtc tcg gac cca gat gca aag aaa ttc	558
Phe Leu Val Lys Gly Met Gly Val Ser Asp Pro Asp Ala Lys Lys Phe	
40 45 50 55	
tac gcc atc acg acg ctc gtc cca gcc atc gcg ttc acg atg tac ctc	606
Tyr Ala Ile Thr Thr Leu Val Pro Ala Ile Ala Phe Thr Met Tyr Leu	
60 65 70	
tcg atg ctg ctg ggg tat ggc ctc aca atg gta ccg ttc ggt ggg gag	654
Ser Met Leu Leu Gly Tyr Gly Leu Thr Met Val Pro Phe Gly Gly Glu	
75 80 85	
cag aac ccc atc tac tgg gcg cgg tac gct gac tgg ctg ttc acc acg	702
Gln Asn Pro Ile Tyr Trp Ala Arg Tyr Ala Asp Trp Leu Phe Thr Thr	
90 95 100	
ccg ctg ttg ttg tta gac ctc gcg ttg ctc gtt gac gcg gat cag gga	750
Pro Leu Leu Leu Leu Asp Leu Ala Leu Leu Val Asp Ala Asp Gln Gly	
105 110 115	
acg atc ctt gcg ctc gtc ggt gcc gac ggc atc atg atc ggg acc ggc	798
Thr Ile Leu Ala Leu Val Gly Ala Asp Gly Ile Met Ile Gly Thr Gly	
120 125 130 135	
ctg gtc ggc gca ctg acg aag gtc tac tcg tac cgc ttc gtg tgg tgg	846
Leu Val Gly Ala Leu Thr Lys Val Tyr Ser Tyr Arg Phe Val Trp Trp	
140 145 150	
gcg atc agc acc gca gcg atg ctg tac atc ctg tac gtg ctg ttc ttc	894
Ala Ile Ser Thr Ala Ala Met Leu Tyr Ile Leu Tyr Val Leu Phe Phe	
155 160 165	
ggg ttc acc tcg aag gcc gaa agc atg cgc ccc gag gtc gca tcc acg	942
Gly Phe Thr Ser Lys Ala Glu Ser Met Arg Pro Glu Val Ala Ser Thr	
170 175 180	
ttc aaa gta ctg cgt aac gtt acc gtt gtg ttg tgg tcc gcg tat ccc	990
Phe Lys Val Leu Arg Asn Val Thr Val Val Leu Trp Ser Ala Tyr Pro	
185 190 195	
gtc gtg tgg ctg atc ggc agc gaa ggt gcg gga atc gtg ccg ctg aac	1038
Val Val Trp Leu Ile Gly Ser Glu Gly Ala Gly Ile Val Pro Leu Asn	
200 205 210 215	
atc gag acg ctg ctg ttc atg gtg ctt gac gtg agc gcg aag gtc ggc	1086
Ile Glu Thr Leu Leu Phe Met Val Leu Asp Val Ser Ala Lys Val Gly	
220 225 230	
ttc ggg ctc atc ctc ctg cgc agt cgt gcg atc ttc ggc gaa gcc gaa	1134
Phe Gly Leu Ile Leu Leu Arg Ser Arg Ala Ile Phe Gly Glu Ala Glu	
235 240 245	

Arg Pro Glu Val Ala Ser Thr Phe Lys Val Leu Arg Asn Val Thr Val
 180 185 190

Val Leu Trp Ser Ala Tyr Pro Val Val Trp Leu Ile Gly Ser Glu Gly
 195 200 205

Ala Gly Ile Val Pro Leu Asn Ile Glu Thr Leu Leu Phe Met Val Leu
 210 215 220

Asp Val Ser Ala Lys Val Gly Phe Gly Leu Ile Leu Leu Arg Ser Arg
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 245 250 255

Ala Ala Ala Thr Ser Asp
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<210> 3
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
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<400> 3
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<210> 4
 <211> 20
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
 primer

<400> 4
 cctcctgagg agtcgtgcga 20

<210> 5
 <211> 91
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
 primer

<400> 5
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 tcggcgacga cgcagaaggc ggagaaggag g 91

<210> 6
<211> 96
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 6
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cctccatgcg cgtgacctcc ttctccgect tctgcg 96

<210> 7
<211> 26
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 7
gtacatcctg tacgtgctgt tcttcg 26

<210> 8
<211> 19
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 8
acgacgggat acgcggacc 19

<210> 9
<211> 22
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 9
atcctgtacg tgctgttctt cg 22

<210> 10
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
 primer

<400> 10
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<210> 11
 <211> 83
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
 primer

<400> 11
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 ctccccgcgcg cgaacatgaa ggg 83

<210> 12
 <211> 75
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
 primer

<400> 12
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 cgcccttcat gttcg 75

<210> 13
 <211> 89
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
 primer

<400> 13
 ggggttcaccg aggtcttcta cctcatccgc aagcagctga caagaaggtc tccgcgtcct 60
 ccggcgaccc gcagaagtac tacggcaag 89

<210> 14
 <211> 90
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<220>
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 primer

<400> 14

cacaacggta acgttacgca gtactttgaa cgtggatgcg acggacttcg cgatcttgag 60
ctccttgccg tagtacttct gcgggtcgcc 90

<210> 15

<211> 84

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 15

gggttcaccg gccagctcgt cttcacggtc aaggaggcgg cggcgagca gcaggagtcg 60
gcgacgacgc agaaggcgga gaag 84

<210> 16

<211> 90

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 16

ggaccacaac acaacggtaa cgttacgcag tactttgaac gtggatgcga cgcggctgac 60
ctccttctcc gccttctgcg tcgtcgccga 90

<210> 17

<211> 68

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 17

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caaggagg 68

<210> 18

<211> 100

<212> DNA

<213> Artificial Sequence

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<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 18
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 tactttgaac gtggatgcga ccatgcgcgt gacctccttc 100

<210> 19
 <211> 74
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
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<400> 19
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 cacgggtcaag gagg 74

<210> 20
 <211> 100
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
 primer

<400> 20
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<210> 21
 <211> 37
 <212> DNA
 <213> Artificial Sequence

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 <223> Description of Artificial Sequence:oligonucleotide
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<400> 21
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<210> 22
 <211> 33
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:oligonucleotide
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<400> 22
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<210> 23
<211> 31
<212> DNA
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<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 23
acgacgggat acgcggacca caacacaacg g 31

<210> 24
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 24
cgggatacgc ggaccacaac acaacgg 27

<210> 25
<211> 93
<212> DNA
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<223> Description of Artificial Sequence:chimeric loop 3
sequence

<220>
<221> CDS
<222> (1)..(93)

<400> 25
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Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln Glu
1 5 10 15

tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc atg gtc 93
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met Val
20 25 30

<210> 26
<211> 31
<212> PRT
<213> Artificial Sequence

<400> 26
Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln Glu
1 5 10 15

Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met Val
20 25 30

<210> 27
<211> 93
<212> DNA
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<222> (1)..(93)

<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 27
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Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
1 5 10 15

cag gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg gtc 93
Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val
20 25 30

<210> 28
<211> 31
<212> PRT
<213> Artificial Sequence

<400> 28
Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
1 5 10 15

Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val
20 25 30

<210> 29
<211> 99
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence

<220>
<221> CDS
<222> (1)..(99)

<400> 29
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Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
1 5 10 15

cag gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc atg 96
Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met
20 25 30

gtc 99
Val

<210> 30
<211> 33
<212> PRT
<213> Artificial Sequence

<400> 30
Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
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Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met
20 25 30

Val

<210> 31
<211> 87
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(90)

<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 31
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Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln Glu
1 5 10 15
tcg gcg acg acg cag aag gcg gag aag gag gtc acg gtc 87
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val
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<210> 32
<211> 29
<212> PRT
<213> Artificial Sequence

<400> 32
Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln Glu
1 5 10 15
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val
20 25

<210> 33
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(96)

<220>

<223> Description of Artificial Sequence:chimeric loop 3
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<400> 33

acc ggc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag	48
Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln	
1 5 10 15	

gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc atg gtc	96
Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met Val	
20 25 30	

<210> 34

<211> 32

<212> PRT

<213> Artificial Sequence

<400> 34

Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln	
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Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Met Val	
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<210> 35

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<221> CDS

<222> (1)..(90)

<220>

<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 35

acc ggc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag	48
Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln	
1 5 10 15	

gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg gtc	90
Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val	
20 25 30	

<210> 36

<211> 30

<212> PRT

<213> Artificial Sequence

<400> 36

Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln	
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Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Val
20 25 30

<210> 37
<211> 96
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(96)

<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 37
acc tac ggc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag 48
Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
1 5 10 15
cag gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc gtc 96
Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 38
<211> 32
<212> PRT
<213> Artificial Sequence

<400> 38
Thr Tyr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln
1 5 10 15
Gln Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 39
<211> 90
<212> DNA
<213> Artificial Sequence

<220>
<221> CDS
<222> (1)..(90)

<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 39
acc cag ctc gtc ttc acg gtc aag gag gcg gcg gcg cag cag cag gag 48
Thr Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln Glu
1 5 10 15
tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc gtc 90
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 40
<211> 30
<212> PRT
<213> Artificial Sequence

<400> 40
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1 5 10 15
Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 41
<211> 93
<212> DNA
<213> Artificial Sequence

<220>
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<222> (1)..(93)

<220>
<223> Description of Artificial Sequence:chimeric loop 3
sequence

<400> 41
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Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln
1 5 10 15
gag tcg gcg acg acg cag aag gcg gag aag gag gtc acg cgc gtc 93
Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 42
<211> 31
<212> PRT
<213> Artificial Sequence

<400> 42
Thr Gly Gln Leu Val Phe Thr Val Lys Glu Ala Ala Ala Gln Gln Gln
1 5 10 15
Glu Ser Ala Thr Thr Gln Lys Ala Glu Lys Glu Val Thr Arg Val
20 25 30

<210> 43
<211> 12
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: high affinity
analog

<400> 43
Val Leu Glu Asp Leu Lys Ser Cys Gly Leu Phe Gly
1 5 10

<210> 44
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:random peptide

<400> 44
Ser Ser Val Phe Leu Val Val Asp Arg Ser Arg
1 5 10

<210> 45
<211> 91
<212> DNA
<213> Halobacterium salinarium

<400> 45
cctgcagggt cgctggactc atccacctca gcattcaccc tgctctttgg tgtgctactc 60
gttctatgac accctcggac caatactggc t 91

<210> 46
<211> 266
<212> DNA
<213> human

<220>
<221> CDS
<222> (2)..(265)

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Tyr Ile Leu Tyr Val Leu Phe Phe Gly Phe Thr Arg Val Phe Gln Glu
1 5 10 15
gcg aag cgc cag ctc cag aag atc gac aag tcc gag ggc cgc ttc cac 97
Ala Lys Arg Gln Leu Gln Lys Ile Asp Lys Ser Glu Gly Arg Phe His
20 25 30
gtc cag aac ctc tcc cag gtc gag cag gac ggc cgc acc ggc cac ggc 145
Val Gln Asn Leu Ser Gln Val Glu Gln Asp Gly Arg Thr Gly His Gly
35 40 45
ctc cgc cgc tcc tcc aag ttc tgc ctc aag gag cac aag gcg ctc aag 193
Leu Arg Arg Ser Ser Lys Phe Cys Leu Lys Glu His Lys Ala Leu Lys
50 55 60
acc ctc gag gtc gca tcc acg ttc aaa gta ctg cgt aac gtt acc gtt 241
Thr Leu Glu Val Ala Ser Thr Phe Lys Val Leu Arg Asn Val Thr Val
65 70 75 80
gtg ttg tgg tcc gcg tat ccc tcg t 266
Val Leu Trp Ser Ala Tyr Pro Ser
85

<210> 47
<211> 88
<212> PRT
<213> human

<400> 47
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1 5 10 15
Ala Lys Arg Gln Leu Gln Lys Ile Asp Lys Ser Glu Gly Arg Phe His
20 25 30
Val Gln Asn Leu Ser Gln Val Glu Gln Asp Gly Arg Thr Gly His Gly
35 40 45
Leu Arg Arg Ser Ser Lys Phe Cys Leu Lys Glu His Lys Ala Leu Lys
50 55 60
Thr Leu Glu Val Ala Ser Thr Phe Lys Val Leu Arg Asn Val Thr Val
65 70 75 80
Val Leu Trp Ser Ala Tyr Pro Ser
85

<210> 48
<211> 90
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 48
ggatgcgacc tcgaggggtct tgagcgcctt gtgctccttg aggcagaact tggaggagcg 60
gcggaggccg tggccggtgc ggccgtcctg 90

<210> 49
<211> 89
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 49
ggatacgcg accacaacac aacggtaacg ttacgcagta ctttgaacgt ggatgcgacc 60
tcgaggggtct tgagcgcctt gtgctcctt 89

<210> 50
<211> 24
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 50

tgtacatgta catcctgtac gtgc

24

<210> 51

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 51

atcctgtacg tgctgttctt cgggttcacc cgcgtcttcc aggaggcgaa gcgccagctc 60

cagaagatcg acaagtccga gggccgcttc

90

<210> 52

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 52

aagcgccagc tccagaagat cgacaagtcc gagggccgct tccacgtcca gaacctctcc 60

caggtcgagc aggacggccg caccggccac

90

<210> 53

<211> 35

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:oligonucleotide
primer

<400> 53

gctgccgata agccacacga ctggatacgc ggacc

35